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EXAMINER
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ART UNIT	PAPER NUMBER
4131	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/575,719	HEES ET AL.	
	Examiner	Art Unit	
	MICHAEL SALVITTI	4131	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 April 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☒ Claim(s) *1 and 13* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *4/13/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claim 1 is objected to because of the following informalities:

Section (c) of claim 1 contains "b)" where it should contain "(b)" to give proper antecedent basis.

In claim 1, substep (b), it appears that “obtainable” should be “obtained”. Appropriate correction is required.

2. Claim 13 is objected to because of the following informalities: The plasticizer disclosed is given the designation “(C)”. The designation “(C)” was given to the radiation-curable component in claim 1. As such, the plasticizer should be labeled “(D)” to remain consistent with claim 1. It appears that the lettering scheme for claim 1 became inconsistent after amending the original claims, and the examiner recommends reverting to the original lettering scheme to retain consistency between the abstract, specification and claims. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 2, 8 and 11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. Claim 2 recites the limitation "(B)" in the second line of the claim. There is insufficient antecedent basis for this limitation in the claim. The radiation-curable component is described in claim 1 to be (C).

6. Claims 8 and 11 recite the limitation "R^1 and R^2". There is insufficient antecedent basis for this limitation in the claim. Claim 1 does not contain the "general formulas I and II"; these formulas are located in claims 6 and 9.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claim 20 is rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 4,981,882 to *Smith et al.* (hereinafter referred to as '882).

Patent '882 discloses a method of making an encapsulated pigment particle containing at least two layers of encapsulation (see Example 1, column 18). This is accomplished by grinding nonionic surfactants, a pigment and water (column 18, lines 15-20), followed by mixing and further dispersion in water (column 18, line 25). Example 1 further shows two encapsulations of the pigment, first by a maleic acid/vinyl acetate copolymer (column 18, lines 27-39) followed by a vinyl acetate/butyl acrylate copolymer encapsulation (column 18, lines 40-53).

Claim 20 further states that at least one comonomer "bears moieties useful for radioactive curing". This feature is defined in the instant specification as a monomer bearing two ethylenic unsaturations (page 17, lines 24-33). '882 discloses dienes, such as butadiene and isoprene, as monomers bearing two unsaturations (column 13, lines 54-55). These monomers are considered useful for radioactive curing according to the instant specification.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

11. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 2002/00065335 A1 to *Noguchi et al.* (hereinafter referred to as '335), in light of U.S. Patent No. 4,981,882 to *Smith et al.*

Application '335 discloses an invention pertaining to an aqueous photocurable resin composition, which is suitable for use as an ink for ink-jet printing applications (paragraph [0002]). This resin contains a pigment particulate (as to claim 1(B); see paragraph [0045]) and a radiation-curable compound (as to claim 1(C); see paragraph [0059]), dispersed in aqueous medium. The disclosure suggests that the pigments can be encapsulated by a polymeric material, as recited by instant claim 1(c)-(d) (see paragraph [0086] and Example 3, paragraph [0201]). The preferred radiation-curable components are shown as structures on pages 4-10 of '335.

Coated pigment particles prepared in the manner recited by instant claim 1 (a)-(d) were not disclosed in '335, although the use of coated particles was noted in Examples 3 and 4, as products obtained from Dainippon Ink (paragraph [0201]) and Fuji Shikiso (paragraph [0206]).

Patent '882 discloses a method of encapsulating a pigment particle comprising at least two layers of polymeric materials (see Example 1, column 18). This is accomplished by grinding nonionic surfactants, a pigment and water (column 18, lines 15-20), followed by mixing and further dispersion in water (column 18, line 25). Example 1 further shows two encapsulations of the pigment, first by a maleic acid/vinyl acetate copolymerization (column 18, lines 27-39) followed by a vinyl acetate/butyl acrylate copolymerization (column 18, lines 40-53). The coated pigments of '882 are said to have numerous

advantages, including preventing agglomeration, aiding in dispersion, and allowing for better mixing of different pigments (column 1, lines 15-29).

Patent '882 teaches the synthesis of coated pigments prepared in the same manner as claim 1(B) of the instant application, and Application '335 teaches an aqueous formulation of coated pigments incorporating a radiation-curable compound, in the same manner as instant claim 1(C) and encompassing the formulation of claim 1. The present application is an obvious combination of these two publications.

At the time of invention, it would have been obvious to a person having ordinary skill in the art to substitute pigment particles coated by a polymer into the dispersion taught in '335. The motivation behind this substitution would be to obtain a better distribution of pigment particles, as taught by '882.

12. Claims 2-18 are further rejected under 35 U.S.C. 103(a) as being unpatentable over US 2002/00065335 A1 to *Noguchi et al.* and U.S. Patent No. 4,981,882 to *Smith et al.* as applied to claim 1 above.

As to claim 2, numerous examples of monomers curable by radiation (i.e. UV light) are disclosed in '335 (see examples of di- and tri-acrylates on pages 4-10 of '335). These monomers contain at least two ethylenically unsaturated bonds.

Claim 3 suggests adding a photoinitiator as a part of step (d) in claim 1. Monomers capable of photoinitiating a polymerization include (meth)acrylic esters of alcohols, as defined by the specification (page 13, lines 29-32). Patent

'882 discloses hydryoxyethyl methacrylate (column 13, line 68) as a demonstrative example of this class of monomers.

Claim 4 cites the polymeric pigment coating (claim 1(d)) possessing a glass transition point above 0°C. The examples of '882 show a copolymer shell having an approximate T_g of 0.11°C (as calculated by the examiner using the Fox Equation, see below).

Fox Equation (see reference from polymerchemistryhypertext.com)

$$1/T_g = w_a/T_{g,a} + w_b/T_{g,b}$$

Using Example 1 of '882 (column 18, lines 15-62);

VA T_g = 28°C and BA T_g = -45°C

$1/T_g$ = 296.4g /28 °C + 63.2 g /-45°C

T_g = 0.11°C

Thus, polymers having a T_g >0 are disclosed.

The disclosure of '882 also shows that several high T_g polymers are also compatible with this composition (e.g. styrene, methyl methacrylate, etc., column 13, line 45 through column 14, line 20). The specification of '882 further shows "the polymer coating may comprise the same polymer throughout its thickness…" (column 14, lines 21-22). Particularly effective ratios are 20-90% vinyl acetate (VA) and 10-80% n-butyl acrylate (BA)(column 14, lines 9-20); copolymers with higher concentration of vinyl acetate would constitute a polymer with a higher T_g.

Claim 5 recites the pigments as organic pigments. Organic pigments are disclosed in both '882 (column 6, lines 45-54) and '335 (paragraphs [0090]-[0093]).

As to claims 6-8, '488 teaches styrene as well as numerous other acrylic monomers which can be defined by General Formulas I and II (column 13, line 45 through column 14, line 20). These coatings may comprise the same polymer throughout or the polymer may vary (column 14, lines 21-22).

Claims 9 and 10 recite an acrylate monomer containing hydrogen, branched, or unbranched carbon chains from three sites for the polymer of claim 1(d). N-butyl acrylate is used in Example 1 of '882 (column 18, lines 15-62), and fulfills the requirements for R^4, R^5 and R^6 given by General Formula II.

Claims 11 and 12 recite iterations of the compound described by General Formula II, or a vinyl aromatic monomer. Methacrylic acid (column 13, line 64 of '882) and styrene (column 13, line 46 of '882) are examples of the molecules recited by claims 11 and 12, respectively.

Claim 13 recites the formulation of claim 1 further comprising a plasticizer. '335 teaches the UV curable aqueous resin acting as a plasticizer prior to curing (paragraph [0109]).

Claim 14 recites the formulation for coloration for substrates. The invention of '335 uses the compound as an aqueous ink (paragraph [0024]), which is inherently used to color substrates.

As to claims 15-18, the invention of '335 is cured by UV light (actinic radiation) after deposition by an ink-jet onto a recording medium (substrate); (see paragraph [0135]).

13. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 2002/00065335 A1 to *Noguchi et al.* and U.S. Patent No. 4,981,882 to *Smith et al.* as applied to claim 1 above, and further in view of United States Patent No. 4,689,049 to *Burke et al*.

Claim 19 recites using the ink as part of a textile printing material. '335 discloses the compounds' greater uses as colorants (paragraph [0256]), but does not disclose the use of the product as a print paste.

Modification of an aqueous dye into a print paste is a known technique in the art, as evidenced by *Burke*. '049 (abstract) discloses that pigment print pastes can be made by adding diorganopolysiloxanes to pigment compositions for the treatment of textiles.

At the time of the invention, it would have been obvious to a person having ordinary skill in the art to add thickeners to an aqueous pigment emulsion with the motivation of thickening it for use as a print paste capable of coloring textiles.

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- U.S. 6,332,943 and U.S. 6,294,592 (both to *Herrmann*) disclose a method of coating pigment particles with a surfactant; the coating is effected by a means of photoinitiated polymerization.
- U.S. 5,952,401 to *Kimura* discloses a method of producing a photocurable ink by a similar method, without encapsulated pigment particles.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL SALVITTI whose telephone number is (571)270-7341. The examiner can normally be reached on Monday to Friday 8AM to 5PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Sample can be reached on (571)272-1376. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/MICHAEL SALVITTI/
Examiner, Art Unit 4131

/David R. Sample/
Supervisory Patent Examiner, Art Unit 4131

M.S.